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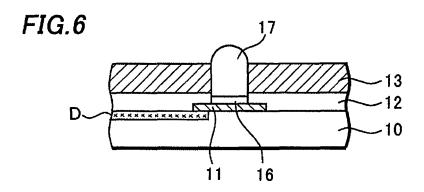
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#### (54) Semiconductor device and manufacturing method of the same

(57) The invention provides a package type semiconductor device and a manufacturing method thereof where reliability is improved without increasing a manufacturing cost. A resin layer (12) and/or a supporting member (13) are formed on a top surface of a semiconductor substrate (10) formed with pad electrodes (11). Then, openings (15) are formed penetrating the resin layer (12) and/or the supporting member (13) so as to expose the pad

electrodes (11). Metal layers (16) are then formed on the pad electrodes (11) exposed in the openings (15), and conductive terminals (17) are formed thereon. Finally, the semiconductor substrate (10) is separated into semiconductor dice by dicing. When this semiconductor device is mounted on a circuit board, the conductive terminals (17) of the semiconductor die and external electrodes of the circuit board are electrically connected with each other.



EP 1 605 519 A3



### **EUROPEAN SEARCH REPORT**

Application Number

EP 05 01 2443

Category	Citation of document with indication	Relevant	CLASSIFICATION OF THE APPLICATION (IPC)		
X	of relevant passages  US 2002/153581 A1 (LIN HAL) 24 October 2002 (2004 abstract * * paragraphs [0019], [0044 abstract * * claims 1-4 * * figure 4 *	2-10-24)	to claim	INV. H01L31/0203 H01L23/31	
X	US 2002/110949 A1 (TONT) AL) 15 August 2002 (2002 * abstract * * paragraphs [0066], [6 * paragraphs [0070] - [6 * figures 9-11 * * paragraphs [0061] - [6	2-08-15) 1067] * 1073] *	1-24		
X	US 2004/023433 A1 (ERIKS ET AL) 5 February 2004 ( * abstract * * paragraphs [0031], [0 [0038], [0040], [0041] [0052], [0056]; figures 1a,1b,2a,3a,4a,5a,6a,7a,	2004-02-05) 035], [0037], , [0046],	1-24	TECHNICAL FIELDS SEARCHED (IPC) H01L	
	The present search report has been dra	<u>'</u>			
Place of search  Berlin		Date of completion of the search  3 December 2008	Mon	Examiner rena, Enrico	
CATEGORY OF CITED DOCUMENTS  X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		E : earlier patent do after the filing da D : document cited L : document cited	T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document oited for other reasons  &: member of the same patent family, corresponding document		

#### ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 05 01 2443

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03-12-2008

C	Patent document sited in search report		Publication date		Patent family member(s)	Publication date
U	S 2002153581	A1	24-10-2002	TW	441134 B	16-06-2001
Ū	S 2002110949	A1	15-08-2002	NONE		
Ū	S 2004023433	A1	05-02-2004	NONE		
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			icial Journal of the Euro			